MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER RESOURCES DIVISION
HUMAN AND WILDLIFE TOXICITY SUMMARY

Chemical Name:	Hydrazine	CAS No.	302-01-2
Derived By:	A. Babcock	Literature Review Date:	01/19/12
Reviewed By:	D. Bush	Verification Date:	1/25/2012

HNV Tier Status:	1	**WV Tier Status:**	
HCV Tier Status:	1		

		Drinking Water		Non-Drinking Water
HUMAN HEALTH	HNV	42 ug/L		3,400 ug/L
	SCREENING LEVEL			
	HCV	0.094 ug/L		7.6 ug/L
	POTENCY		3.6976271 (mg/kg/d)-1	
	HH-BAF-TL.3		1.0 L/kg	
	HH-BAF-TL.4		1.0 L/kg	
	RfD (ADE)		0.0015 mg/kg/d	
WILDLIFE HEALTH	WV			
	WV-BAF-TL.3			
	WV-BAF-TL.4			
	RfD			
AESTHETICS	TASTE THRESHOLD			
	ODOR THRESHOLD			

Comments:

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER RESOURCES DIVISION
HUMAN NONCANCER VALUE WORKSHEET

Chemical Name:	Hydrazine	CAS No.	302-01-2
Developed By:	A. Babcock	Literature Search Date:	1/19/2012
Reviewed By:	D. Bush	Verification Date:	1/25/2012

Key Study: Steinhoff and Mohr (1988) administered hydrazine via the drinking water to male and female Wistar rats for their lifetimes. No effects were observed in males or females exposed to a concentration of 2 mg/L. Using water ingestion rates reported in the study, these concentrations are equivalent to doses of 0.12 and 0.2 mg/kg/d for males and females, respectively. The geometric mean of these two values (0.15 mg/kg/d) was used to derive the ADE.

ADE = 0.0015 mg/kg/d

$$ADE = \frac{0.15\ mg/kg/d}{100}$$

Where UF = 10x each for intra- and interspecies extrapolation.

drinking water

$$HNV = \frac{(0.0015\ mg/kg/d)\ (70\ kg)\ (0.8)}{(2\ L/d) + (0.0036\ kg/d * 1.0\ L/kg + (0.0114\ kg/d * 1.0\ L/kg)} = 41.69\ ug/L$$

Human Noncancer Value for drinking water = 42 ug/L

non-drinking water

$$HNV = \frac{(0.0015\ mg/kg/d)\ (70\ kg)\ (0.8)}{(0.01\ L/d) + (0.0036\ kg/d * 1.0\ L/kg + (0.0114\ kg/d * 1.0\ L/kg)} = 3{,}360.00\ ug/L$$

Human Noncancer Value for non-drinking water = 3,400 ug/L

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WATER RESOURCES DIVISION
HUMAN CANCER VALUE WORKSHEET

Chemical Name:	Hydrazine	CAS Number:	302-01-2
Developed By:	A. Babcock	Literature Search Date:	1/19/2012
Reviewed By:	D. Bush	Verification Date:	1/25/2012

Key Study: Biancifiori (1970) administered hydrazine sulfate (25% hydrazine) via gavage to male and female CBA/Cb/Se (CBA) mice a total of 150 times over 25 weeks (average of 6 days per week.) . Administered doses were 0.14, 0.28, 0.56, or 1.13 mg/day. Hepatomas were found in both sexes in the controls and every treatment group, except for lowest dose females. The female tumor data did not reveal a dose-response, thus the male data are used in this assessment. The authors state the the average adult body weight of the male CBA mice was 0.025 kg. Mice were examined at natural death or sacrificed if moribund; total study time was 100 weeks.

SAD (mg/kg/d)	Tumors / Animals at Risk	Animal Weight
0	3 / 30	0.025 kg
0.3	1 / 26	
0.59	7 / 25	
1.2	12 / 25	
2.4	15 / 25	

GLOBAL 82 Results:

$$q = \frac{\text{95\% Upper Confidence Limit}}{\text{MLE}} \qquad q = \frac{1.59E\text{-}05}{3.12E\text{-}05} \qquad \mathbf{q = 0.508315793}$$

q^* = (q) (species scaling factor)

$q^* = 0.508316\ (\text{mg/kg/d})^{-1} * (70\ \text{kg}/0.025\ \text{kg})^{1/4}$ **$q^* = 3.70E+00$**

$$RAD = \frac{0.00001}{q^*} \qquad \mathbf{RAD = 2.70E\text{-}06}$$

$$HCV_{drink} = \frac{0.00000270\ \text{mg/kg/d} \times 70\ \text{kg}}{2.0\ \text{L/d} + [(0.0036\ \text{kg/d} \times 1\ \text{L/kg}) + 0.0114\ \text{kg/d} \times 1\ \text{L/kg})]}$$

$HCV_{drink} = 0.094$ ug/L

$$HCV_{nondrink} = \frac{0.00000270\ \text{mg/kg/d} \times 70\ \text{kg}}{0.01\ \text{L/d} + [(0.0036\ \text{kg/d} \times 1\ \text{L/kg}) + 0.0114\ \text{kg/d} \times 1\ \text{L/kg})]}$$

$HCV_{nondrink} = 7.6$ ug/L

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER RESOURCES DIVISION
BIOACCUMULATION FACTOR WORKSHEET

Chemical Name: Hydrazine CAS No. 302-01-2
BAF Derived By: A. Babcock Literature Review Date: 1/19/2012
BAF Reviewed By: D. Bush Verification Date: 1/25/2012

HH-BAF-TL.3: 1.0 L/kg **WL-BAF-TL.3:**
HH-BAF-TL.4: 1.0 L/kg **WL-BAF-TL.4:**

I. FIELD BAFs, BSAFs, or LABORATORY BCFs

Ref #	BAF, BSAF, or BCF	Value	Species	Exposure Duration days	Tissue Type	Tissue Lipid (%)	Steady State Tissue Conc.	Water or Sed. (BSAF) Conc.
.)								
.)								
.)								
.)								
.)								
.)								
.)								

Final BAF, BSAF, or BCF:
Justification:

II. LOG Kow VALUES

Ref #	Meas./Calc. Log Kow	Method	Value	Meas./Calc. Log Kow	Method	Value
1.)	Calculated	Clog P	-1.68			

Final Log Kow: -1.68
Justification: The calculated value is the only available value.

Food Chain Multipliers
FCM-TL.3: 1.0000
FCM-TL.4: 1.0000

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Assessment/Calculations: Final log Kow -1.68

$$f_{fd\ ambient} = 1 / [1 + (2.4 \times 10^{-7})(10^{\log Kow})]$$

$$f_{fd\ ambient} = 0.999999995$$

Baseline BAF_{TLN} = (FCM) (Kow)

Baseline BAF_{TL3} = (1) (0.020892961)
Baseline BAF_{TL3} = 0.020893

Baseline BAF_{TL4} = (1) (0.020892961)
Baseline BAF_{TL4} = 0.020893

$HH\ BAF_{TL3} = [(Baseline\ BAF_{TL3})(0.0182) + 1]\ (f_{fd\ ambient})$
$HH\ BAF_{TL3} = (0.020893 * 0.0182 + 1) * 0.999999995$
$HH\ BAF_{TL3} = 1.00038 = 1.0\ L/kg$

$HH\ BAF_{TL4} = [(Baseline\ BAF_{TL4})(0.031) + 1]\ (f_{fd\ ambient})$
$HH\ BAF_{TL4} = (0.020893 * 0.031 + 1) * 0.999999995$
$HH\ BAF_{TL4} = 1.00065 = 1.0\ L/kg$

References:

1) US EPA. 2012. ASTER Ecotoxicity Profile for Hydrazine, 302-01-2.